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ABSTRACT

The proposed organizational and activity structure for an Educational Technology Center would provide opportunities for educational research, hardware/software/courseware services, and training programs to prepare professionals in the field. Advances in industrial, communications, and educational technologies necessitate the implementation of an interdisciplinary approach to the upgrading of inservice teachers and for the preparation of new teachers entering the field. Noting that educational technology is a diverse, multi-disciplinary area of studies, this report recommends the removal of restricting bonds and the implementation of a more flexible approach that would provide coursework in a variety of disciplines. The administrative structure is explored using a model that identifies three main areas the center should address: instruction (technology of curriculum design, learning theories, and teaching/learning styles); research; and services. Operational activities that the center should participate in are also looked at, and elementary functions are identified under each of the three major headings. A collection of courses available to educational technology students in one institution is listed to demonstrate the types of skills needed and the interdisciplinary nature of the course offerings. (Author/THC)

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# AN EDUCATIONAL TECHNOLOGY CENTER: A PROPOSED ORGANIZATIONAL STRUCTURE

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## Abstract

This article proposes an organizational and activity structure for Educational Technology Center which will provide opportunities for educational research, hardware/software/courseware services and training programs to prepare professionals in the field. Advances in industrial, communications and educational technologies necessitate the implementation of an interdisciplinary approach to the upgrading of inservice teachers and for the preparation of new teachers entering the field. Program, curriculum and service activities are outlined in the presentation.

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## Introduction

Educational Technology is a diverse, multi-disciplinary area of studies. The utilization of high level technologies from the fields of electronics group and individual communication, psychology, administration, research and educational media directed specifically to the teaching/learning environment have transcended the specific discipline of education. Related to today's professional higher

education organizational structure, unless specifically organized, a professional school of education is not capable of providing all of the theoretical and technical experiences required for a competent educational technologist. In order to provide for the diverse experiences essential to the preparation of educational technologists, the removal of restricting bonds inherent to a unique or single discipline of studies is evident. A more flexible approach which provides coursework in a variety of disciplines, all contributing to the specific requirements directed toward the teaching/learning process, is a more reasonable approach.

Administrative Structure

Because any interdisciplinary program has no "home" and thus no direct accountability relationships, it is imperative that some type of program responsibility is identified. For undergraduate programs, it may fall within the professional education requirements within the school of education. At the graduate level, the graduate school may become the administrative agent. The autonomy reflected by most existing graduate programs within a given discipline impede the entrance of "outside" students into those disciplines. The attitude of most disciplines is to "take care of our majors" first and then provide for outside students as time and class space become available. In addition, the imposition of requiring massive undergraduate prerequisites for the non-major entrance into some disciplines discourages enrollment in some advanced classes. To

keep these restrictions at a controllable level and to establish a working relationship at the interdisciplinary level, the graduate school appears to be in a crucial and most advantageous position.

A proposed organizational structure for an educational technology center is described in Figure 1.

EDUCATIONAL TECHNOLOGY CENTER

INSTRUCTION RESEARCH SERVICES

Figure 1

The model identifies that there are three main areas which the center should address. These are instruction, research and service.

Within the instructional area, the educational program should address the technology of curriculum design learning theories and teaching/learning styles. This area of the program should be responsible for preparing individuals in the fundamentals of "how to teach". As part of the instructional program, individuals in this area should be exposed to an internship designed as a support role to ongoing traditional educational programs. Students would be taught the operational phases of the various technologies with which they will be faced in the educational environment. It is in the instructional area that both theory and practice in the processes of education are combined. Specific experiences will be identified later under the operational activities.

The second major area to be addressed by the center is research. The speed with which changes in technology are occurring make thorough research of new technologies prior to their implementation in education impossible. Practice has shown that new hardware is sometimes purchased for educational use before data is available on its instructional effectiveness. The pressure of "it's the thing to do" may lead to faulty applications of some types of technology in the classroom. The proliferation of computers, especially micros, into education is a good example of a technology ahead of its information base. Educational technologists must be well versed into the process of how to do good research related to educational process and be well informed of what existing research says about the applications of technology in the classroom.

The third major area of the center is service. It is impossible to expect each school or school district or similar unit to be able to provide for their teachers all of the variations in hardware and program materials which they may need. Historically, higher education institutions have been placed geographically to provide educational services. Higher educarion institutions can be a clearing house for the Educational Technology materials/equipment available to schools. The software generation/dissemination, hardware interfacing and evaluation of systems might well be provided by the service center within the university. In many present situations, the board of cooperative educational services now provides for this type of support. Higher costs of education and decreased funds available in the marketplace may make the

transition from the local school to an educational institution of higher learning very attractive. In addition, the availability of data bases now accessible in networking arrangements make the centralization of these types of facilities more attractive to the institutions of higher learning. At any rate, the public schools need a place to go to obtain the latest educational information, instructional service and technological support. An Educational Technology Center should provide for this professional support.

Operational Activities

In order to provide more specific information on the types of activities in which the center should participate, I will identify some elementary functions under each of these major headings. Previous research identifies ten major functions with which any competent classroom teacher and educational technologist should be held accountable (Wright, 1973). The functions listed below and some of their suggested activities should be taught in the professional education courses required of the educational technologist. In addition, any coursework outside of education should be considered as a possible source of educational support if it contributes to the student's ability to learn and perform these functions.

The major instructional functions in order of their importance as judged by the teachers are:

Facilitating learning

Improving the teacher's individual competency

Designing instruction

Nurturing humaneness in students

Managing the learning environment

Designing programs

From an operational point of view, any course which teaches activities such as educational analysis, writing educational specifications, motivation theory, learning styles of students, teaching styles of faculty, student assessment, curriculum structures for course organization, systems theory and methodology, administrative principles/techniques, hardware utilization, hardware operation, support services available to the teacher and course organization or generation will contribute to the above major functions. A more detailed analysis of specific student outcomes is available but will not be cited here because of space limitations.

Related to these specific instructional competencies to be taught to the educational technologist in training is the implication that any inservice programs taught in the field to practicing teachers should also include any new information developed since their graduation. Classroom instruction is now and will be in the future more severely affected by changes in Educational Technology than any other single element. The importance in continuing education courses for practicing teachers should not be underestimated. Educational technology is now and will be in the immediate future, a major concern in the public and private sectors.

The operational activities related to reseach are two-fold. Educational technologists must be able to utilize research findings and existing information as well as be able to perform research activities on the job. The techniques of data base searching, abstract collecting, problem isolation, research design, test generation, generation of student evaluation inventories, package utilization, knowledge of research systems and research tools and techniques are fundamental to the educational technologist. Not only should these activities be known and understood in the local school setting, they should also be expanded to include identification of external funding sources and the generation of contracts with industry and government. Any educational technologist not able to identify specific problems, isolate and structure an acceptable research proposal and find adequate funds to conduct the study is ill-prepared to be classified a technologist. It is the "reduction to practice," the "praxiology" of the idea that separates the theorist from the practitioner. Educational technology by its very definition implies the application and/or research of the best we know in the process of education.

Coursework which provides experience in educational research methods, descriptive and inferential statistics, problem isolation, storage and retrieval systems available to the researcher, instrument development/generation, data processing and research reporting techniques are all necessary to the technologist. Further, it is essential that the educational technologist be involved in the administrative decision making process if those

decisions involve instructional problems. Any instructional decisions not supported by sound research data may be bad decisions both economically and educationally.

Finally, the major functions related to the service area are:

Evaluation of programs

Evaluation of instruction

Providing professional/technical services

An educational technology center should be able to provide for the evaluation of programs and instructional strategies. In doing so, it should be able to asses process, product, program and personnel. The evaluation may be part of an ongoing program accountability structure or it may be a planned periodic function done on a demand or request basis. Educational institutions, both private and public, should rely on external evaluations in ensure non-biased judgment, high validity and reliability in their evaluation efforts. These evaluations could well be done under the direction of an accreditation unit or similar agency. At any rate, it is expected that the center should provide the know-how and implementation activities for such evaluations.

Related to the services area is the ability of the center to provide support to educational programs, be it public/private schools or industrial training. The center should be in a position to contract for these services which it is able to perform. Some of the funds generated in this manner form the private sector could be used to support the service activities of public school programs.

For example, the center could generate and disseminate educational software in unique areas for in-plant training programs for industry. If arrangements can be worked out, elements of that generation might well be used in the public school programs. An example would be a basic electronics training program for a service industry which may have application in a community college or vocational school. The quality of such an effort would ensure technical expertise from industries input and educational effectiveness from professional education's input--the best of both worlds. Also, a closer relationship with industrial training systems should be established by education. The Educational Technology Center is a logical focal point for this interchange.

Other services which could be provided by the educational technology center include evaluating commercial educational materials such as video tapes, films, tape-slide series and computer based education packages. Sound judgments regarding the educational methodology used in the product could be made. This evaluation might include CMI student registration and recordkeeping functions, CAI tutorial presentations which involve simulations, directed learning experiences, drill and practice and testing. It may even be expanded to include the establishment and evaluation of educational models, learning activity packages, professional publications and research findings relative to the field.

Along with this software support, a parallel evaluation process could be made of the hardware systems available. Judgments about the characteristics of micros, mainframes and their interfacing

problems could be addressed. Services which provide for computer programming interfacing, uploading/downloading, networking and teleconferencing can be provided. In essence, the center could become the source for possible hardware solutions to educational problems much as it provided guidance in the selection and utilization of software/courseware.

Because no single school district will be able to provide for itself all of the technical services it will need in the future, it stands to reason that a centralized agency can provide such services as a cooperative effort. As technology becomes more advanced in education, the need for greater and greater outside professional and technical support is self-evident. The availability of outside data bases which can be accessed by the public schools will require specialists in a number of technologies to manage, update and monitor those data bases. The public schools will not be able to find or possibly even afford individuals in all of these technical areas but they should be provided access to such technical expertise with an educational technical center.

In this same service are, the Educational Technology Center could easily serve as a depository for instructional materials. Video tapes, films, computer programs, management systems and the like could be made available to the members of public and private educational institutions for examination and trial. Judgments on purchasing such materials could then be made on knowledge rather than on publicity.

Educational Technology Programs

The graduate programs of most accredited institutions have access to most of the theoretical and technical course content to prepare educational technologists. These courses are not, however, generally housed in a single academic discipline. It, therefore, seems likely that a program of studies which is interdisciplinary in nature is the most practical way to prepare educationalists. A single administrative unit, be it education, computer science, technology or communications is not able to provide all of the competencies required of the educational technology graduate. The program and the center should be institution wide, not department oriented. The program administration, however, should probably be done within the professional educational program.

To provide for some specific examples, here are a collection of courses available in one institution which can be used to produce an educational technologist. No attempt is made here to say this list is totally complete or that the course offerings are educationally adequate. This example is given to demonstrate types of skills needed by the educational technologist and the interdisciplinary nature of the course offerings. I will attempt to list these course titles under the three major headings--instruction, research and service--previously identified for the center.

## INSTRUCTION

| Discipline | |
|---|---|
| Technology | Technology and Its Impact on Society<br>Technical Illustration/Computer Graphics<br>Maintenance of Educational Technology Hardware<br>Digital/Microprocessors<br>Analog Electronic Devices<br>Construction Techniques<br>(Simulators/Dynamic Demonstrators) |
| Education | Orientation to Computer Based Education<br>Computer Managed Instruction<br>Computer Assisted Instruction<br>Educational Analysis Techniques<br>Individualized Learning Activity Packages<br>Design/Construction of Audio Visual Resources<br>Cataloging/Classification of Educational Materials<br>Philosophy/Theory of Instructional Technology<br>Educational Accountability |
| Administration | Introduction to Administrative Theory<br>Educational Planning<br>Management Systems Analysis<br>Educational Decision Making<br>Executive Leadership |
| Communications | Photography (Black and White/Color)<br>Basic Radio Production<br>Television Production<br>Cable Television/Satellite Transmission<br>Organization/Production in Graphic Arts<br>Offset Lithography<br>Teleconferencing |
| Psychology | Principles of Learning<br>Human Information Processing<br>Theories of Motivation<br>Psychology of Individual Differences<br>Learning Theories: Cognitive Approaches<br>Psychological Services |

## RESEARCH

| | |
|---|---|
| Research | Introduction to Research<br>Educational Storage and Retrieval Systems<br>Research Proposal Preparation<br>Evaluation of Research<br>Research Methodology<br>Educational Tests and Measurements |

| | |
|---|---|
| Statistics | Descriptive Statistics<br>Inferential Statistics<br>Analysis of Variance |

SERVICES/EVALUATION

| | |
|---|---|
| Evaluation | Evaluation and Measurement<br>Evaluation of CBE Software<br>Hardware Evaluation and Interfacing<br>Educational Systems Evaluation |
| Computer Science | Programming Languages<br>BASIC<br>FORTPAN<br>COBOL<br>ADA<br>APL<br>PILOT (Super)<br>LOGO<br>CAI (Tutorial Systems)<br>PHOENIX (Mainframe Menu Systems)<br>Computer Languages (Machine, Assembler, Compiler, Interpreter)<br>Networking Computer Systems<br>Video-Disk Interfacing<br>Data Bases (Interfacing and Access)<br>Data Processing Systems/Methods |

From the collection of courses just presented, you can see that seven or eight disciplines are required to meet the educational preparation of the educational technologist. Although some of the courses listed might be available in the undergraduate program, it is essentially a graduate level offering. This would imply that people entering the field probably have a subject area specialization in their undergraduate program and a degree in education with a teaching credential. These are considered basic for entry level into an educational technology degree program. People without an education degree would have additional deficiencies in the field of educational psychology and educational foundations to make up.

Future Expectations

Traditional educational media programs in higher education have addressed the development of instructional audio/visual aids for the classroom teacher. With the advent of the computer and its baby brother, the micro, a whole new generation of instructional devices and educational systems became available. The ability to interface a number of different types of media and a higher level of sophistication in the teaching/learning process have permanently altered the traditional way teachers teach and the avenues available for students to learn. Educational Technology is not a glorified souped-up version of educational media but is an extensive new direction open to education. The interfacing of student assessment, study habit skills, establishing learning/teaching styles with the new and expanding technologies is the future of education. Teachers are still going to be needed but the techniques used by them in the past will of necessity, have to be changed. The decentralization of information, the extensive utilization of technology planned for the future will change the role of the teacher from presenter to facilitator. The teacher of tomorrow will be a user of technology in the classroom and must be informed of the affects that technology will have on them and their students. Having an "ace in the hole" with access to an educational technology center will relieve them of the pressure generated by high levels of technology available to the teacher. Having personnel available to utilize these technologies will be the key to the Center's success.

BIBLIOGRAPHY

Wright, L. W. Functions of a classroom teacher. Unpublished staff study, University of Wisconsin-Stout, Menomonie, 1973.